

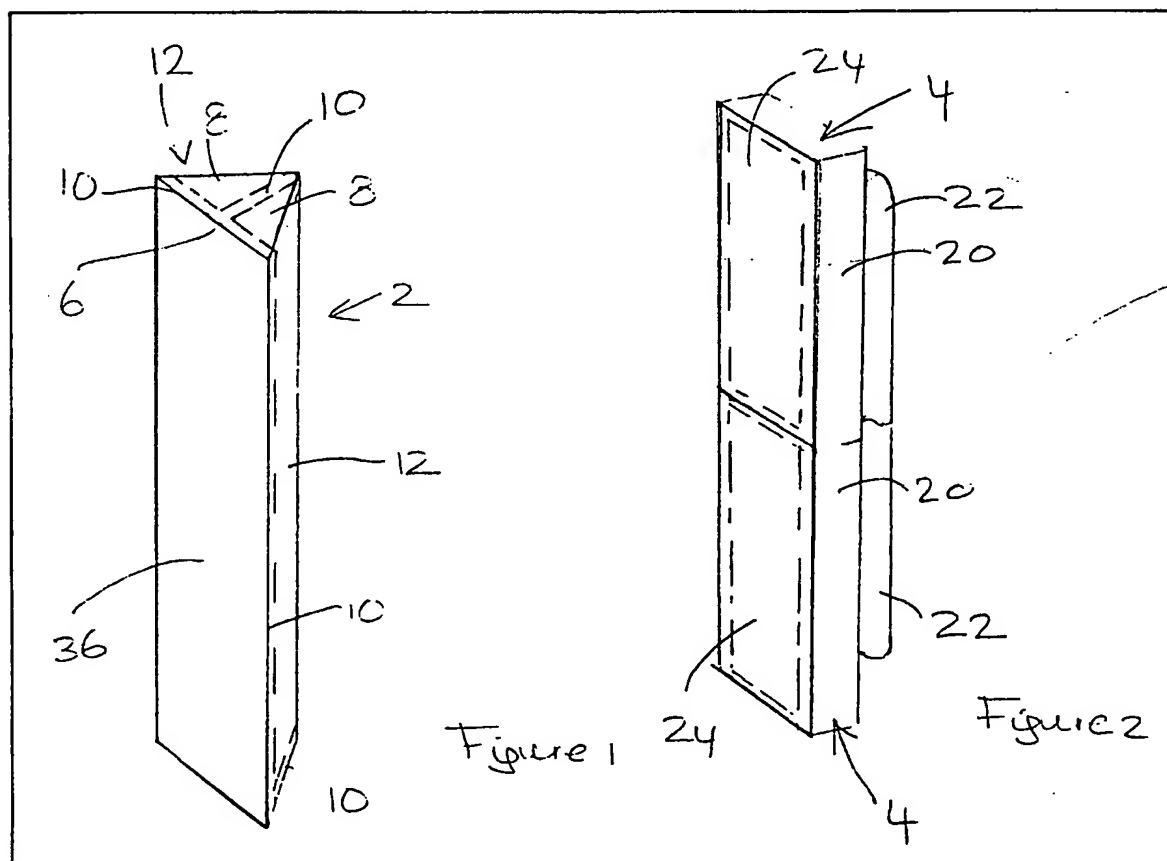
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(54) Apparatus for cleaning aquarium glass panels

(57) An apparatus for cleaning the inner surfaces of aquarium glass panels includes an interior device (2) having a permanent magnetic field and a pair of cleaning faces (12) substantially perpendicular to each other and a pair of exterior devices (20) each having a permanent magnetic field for manipulating the interior device. The devices (20) can be moved separately so that each can exert an attractive force towards the facing cleaning face (12) at a corner between aquarium panels. The interior device (2) can be passed from the control of one device (20) on one panel to the other device (20) on the other aquarium panel.



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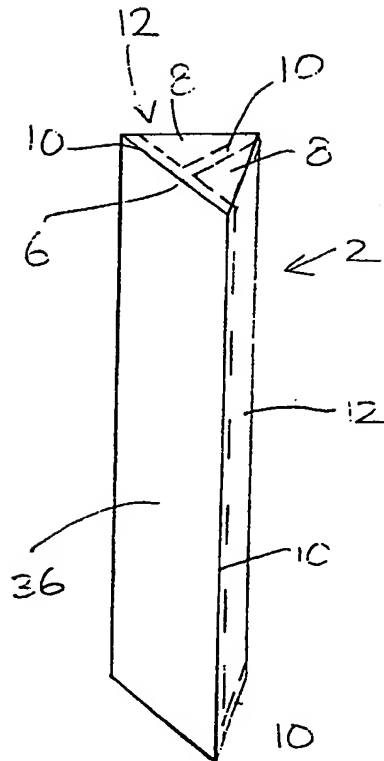
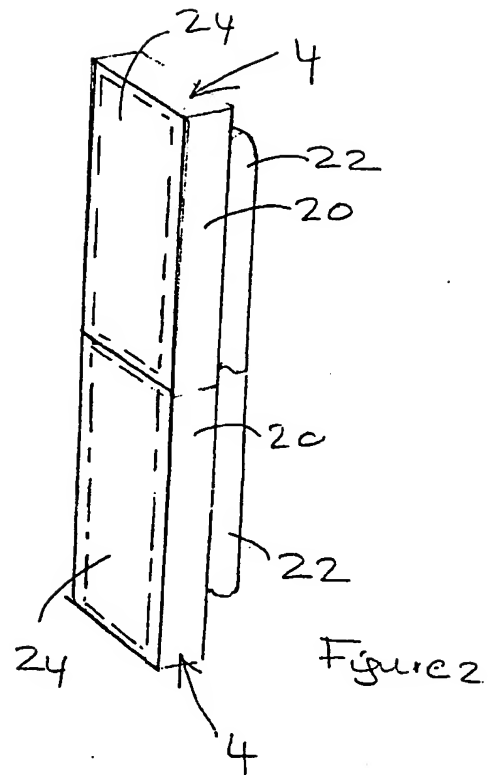
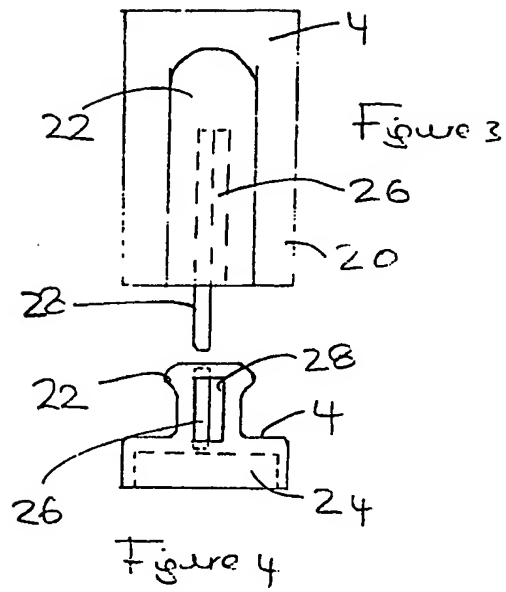


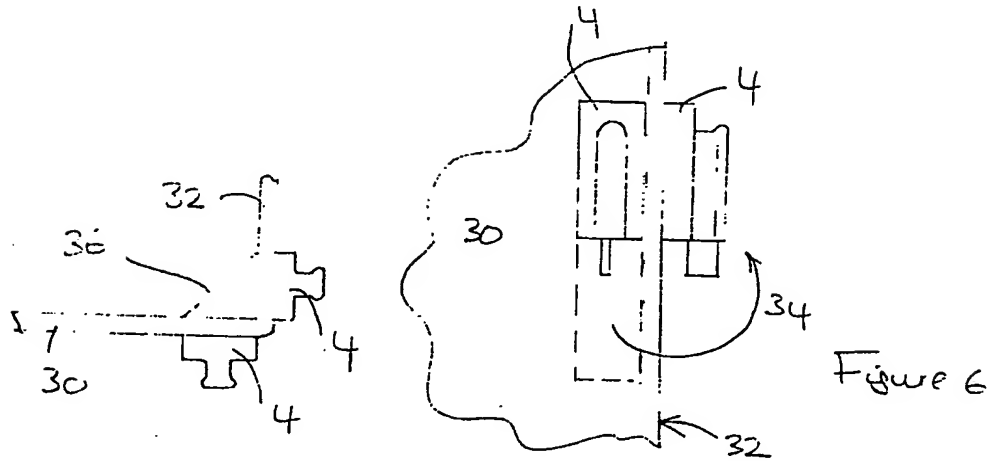
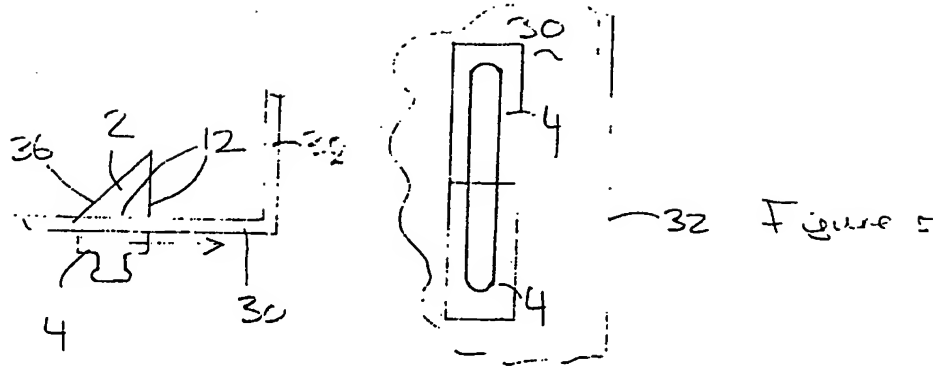
Figure 1

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SPECIFICATION

Cleaning apparatus for aquaria

- 5 The invention relates to cleaning devices for aquaria.

Apparatus is known for cleaning aquaria which includes an exterior device with a permanent magnet for manipulation on the outside of a transparent panel and an interior device also with a permanent magnet and having a cleaning face for following the movement of the exterior device so as to clean the inside of the transparent panel.

- 10 It is the object of the invention to provide an improved apparatus which is capable of moving from one aquarium panel face to another without requiring that the interior device be supported from the inside.

According to this invention there is provided an apparatus for cleaning the inside of aquarium panels which apparatus includes an interior device having a permanent magnetic field and a pair of cleaning faces substantially at a 90° angle with respect to each other and a pair of exterior devices each having a permanent magnetic field for attracting the interior device, the exterior devices being movable separately of one another so that each can exert an attractive force towards the respective cleaning face at a corner between adjacent aquarium panels and the interior device can pass from the control of one exterior device on one panel to the other exterior device on the other panel.

The aquarium panels can thus be cleaned on the inside by one interior device which operates on a number of panels. The panels may be joined by adhesive, cement etc. or may be made integrally by moulding.

Preferably each exterior device occupies half of one cleaning face of the interior device and is configured so that the pair of exterior devices can be manipulated as one to clean a particular panel. Thus the whole apparatus can be left safely in position on the aquarium when it is not in use and a compact overall construction results. In such a construction advantageously the exterior devices are arranged for being coupled together rigidly for example by a suitable plug and socket connection. Such a connection is established conveniently by a projection and recess on each exterior device so that the devices have the same shape.

A suitable permanent magnet arrangement may be provided behind each of the cleaning faces of the interior device.

Figures 1 and 2 show perspective views of interior and exterior devices of an apparatus of the invention;

Figures 3 and 4 show a plan and end view of the exterior devices of Figure 2; and

Figures 5 and 6 show plan and side views of different stages of manipulation of the apparatus.

With reference to the Figures, an apparatus for cleaning the inside of aquarium panels includes an

interior device 2 (Figure 1) and a pair of identical, interlockable exterior devices 4 (Figures 2, 3 and 4).

65 The device 2 includes a T-section plastic moulding 6 mounting permanent magnets 8 in the corners between walls 10 of the moulding. Together the moulding 6 and magnets 8 provide a triangular section with cleaning faces 12 formed by suitable fabric adhered to the magnets 8, the faces 12 being at 90° to each other. Each exterior device 4 has a recessed body part 20 carrying an upstanding grip 22. The body part 20 mounts a magnet 24 in its recess. The grip 22 has a recess 26 and a projection 28 on either side of its longitudinal centre-line. Thus a pair of devices 4 can interlock (Figure 2) by the projections 28 sliding into the recesses 26.

The magnets 8 and 24 are arranged so that the magnetic field lines extend generally longitudinally. 80 The different magnets 8 have their respective north and south poles lying next to each other at a particular end of the interior device 2. The different magnets 24 are aligned so that when the exterior devices 4 are interlocked, the north pole of one lies close to the south pole of the other.

In use the apparatus can be used to clean the inside of an aquarium panel 30 by interlocking a pair of exterior devices 4 (Figure 2, Figure 5) and using them to manipulate the interior device 2 submerged 90 in the aquarium. The devices 4 can be bodily rotated etc as the poles of one magnet 8 are attracted towards the poles of the magnets 24. To change from one aquarium panel 30 to an adjacent one 32, the devices 4 are slid in the direction of arrow 34 95 (Figure 5) until the interior device 2 nests in the angle between the panels 30 and 32 with each of its cleaning faces contacting a panel. Then (Figure 6) one of the exterior elements 4 is uncoupled and lifted off the panel 30. That element is then turned upside down so that its magnetic field becomes suitably aligned for attracting the other magnet 8. It is then placed (Figure 6) on the panel 32 where it holds the interior device 2. The remaining exterior device 4 can be taken off the panel 30, turned upside 100 down and coupled to the exterior device already on the panel 32.

The whole assembly formed by the exterior devices 4 can be turned through 180° on the face 32 so that the 90° angle between the cleaning faces 12 can be nested in another angle between aquarium panels with the rear face 36 facing right and not left as shown in Figures 5 and 6.

The apparatus can thus be used to clean all interior surfaces of aquarium panels from the outside of the aquarium with virtually no risk of the interior device 2 dropping to the bottom.

The face of the exterior devices 4 connecting the panels may be covered with a soft material to facilitate sliding.

120 The magnets 8 and 24 may be of a single body of material or comprise a number of magnets joined end to end.

CLAIMS

1. An apparatus for cleaning the inside of

- aquarium panels which apparatus includes an interior device having a permanent magnetic field and a pair of cleaning faces substantially at a 90° angle with respect to each other and a pair of exterior
- 5 devices each having a permanent magnetic field for attracting the interior device, the exterior devices being movable separately of one another so that each can exert an attractive force towards the
- 10 respective cleaning face at a corner between adjacent aquarium panels and the interior device can pass from the control of one exterior device on one panel to the other exterior device on the other panel.
2. An apparatus according to claim 1 in which each exterior device occupies half of one cleaning
- 15 face of the interior device and is configured so that the pair of exterior devices can be manipulated as one to clean a particular panel.
3. An apparatus according to claim 2 in which the exterior devices are arranged for being coupled
- 20 together rigidly.
4. An apparatus according to claim 3 in which the exterior devices are connected by a projection and recess on each exterior device so that the devices have the same shape.
- 25 5. An apparatus for cleaning the inside of aquarium panels substantially as specifically described by reference to and as shown in the Figures.

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